Department of Botany

Lesson Plan for (CBCS General) for the Academic Session 2018-2019

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-I							
CC-I	DSC-1AT Biodiversity (Microbes, Algae, Fungi and Archegoniate)	1.	a) Viruses.	To know about Structure, Type and Economic importance of Viruses.	1. What is virion? 2. Give example DNA & RNA viruses	G.M.	Lecture
			b) Bacteria.	To Know About cell structure, Reproduction and economic importance	1.What is plasmid? 2. What is Mesosome? What is Gonophore?	P.M.	Lecture
		2.	Algae	1. General knowledge about algae. 2.Classification of algae 3.Economic importance of algae	1.What is Thallus? 2. Example an algae which is rich in protein. 3. What is the importance of algae in medicine.	G.M.	Lecture
		3.	Fungi	1.To know about General characteristics of Fungi 2. Knowing reproduction and classification. 3. Knowledge about Nutrition. 4. To know about Symbiotic Associations of Lichens Mycorrhiza.	1. What are true Fungi? 2. Name two edible and poisonous mushroom. 3. What is dolipore septum?	P.M.	Lecture

		4.	Introduction to Archegoniate	1.To know about Archegoniate. 2. Knowledge about Alternation of generation.	1. What is Archegoniate? 2. Define Alternation of generation.	P.M.	Lecture
		5.	Bryophytes	1.Knowing general characteristics, classification of Bryophytes 2. Knowledge about Morphology, anatomy, and Reproduction of Marchantia and Funaria. 3. Know about Ecological importance of bryophytes (Sphagnum)	1. Why Bryophytes are calling amphibian? 2. Write the importance of bryophytes.	P.M.	Lecture
		6.	Pteridophytes	1.Knowing about Early land plant 2. Knowing about Morphology, anatomy and Reproduction of selaginella, Equisetum and Pteris. 3. Knowledge about stelar evolution.	1.what is Heterospory? 2. What is the importance of Selaginella?	G.M.	Lecture
		7.	Gymnosperm	1. To know General characteristics of gymnosperm. 2. Knowing about morphology, anatomy and reproduction	1.What is Coralloid root? What is the importance of Gymnosperm	G.M.	Lecture

				of Cycas and Pinus. 3. Ecological and economical importance.			
	DSC-C1P Biodiversity (Microbes, Algae, Fungi and Archegoniate (Practical)	1.	Models of TMV-viruses	Knowing about Viruses	Draw structures and label its part.	G.M.	Demonstration
		2.	Study of vegetative and reproductive structures of algae	Gain knowledge about reproductive structures of Nostoc, Oedogonium, Vaucheria	Write the identifying characters of vaucheria.	G.M.	Demonstration
		3.	Agaricus	Study about Sectioning of gills of Agaricus	Write the identifying characters of Agaricus and draw its fruit body with label.	P.M.	Demonstration
		4.	Selaginella	Know about morphology and strobilus of Selaginella.	Draw and label Strobilus of Selaginella.	P.M.	Demonstration
		5.	Pteris	Knowing about Morphology, rachis and spore of Pteris	Write the characteristics of Pteris.	G.M.	Demonstration

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-II							
CC-II	DSC1B(C2T): Plant Ecology and Taxonomy	1.	Introduction	To know about Ecology.	1.What is ecology? 2. who coined the name ecology	P.M.	Lecture

		2.	Ecological factors	1.Knowing about Soil and its formation. 2. To know about soil profile. 3. Knowledge aboutStates of water in the environment, precipitation types. 4. KnowingLight and temperature 5. Know about Shelford law of tolerance. 6. Know about Adaptation of hydrophytes and xerophytes.	1.What is soil profile? 2.What is capillary water? 3. What is Shelford law? 4. Name two xerophytic plant.	P.M.	Lecture
		3.	Plant communities	1.To know about Ecotone and edge effect 2.Knowledge about Succession, Processes and types.	1. What is ecotone and edge effect? 2. What is the pioneer of xerosere? 3. what is sere?	P.M.	Lecture
		4.	Ecosystem	1. To know about ecosystem, energy flow trophic organization. 2. Knowing Food chains and food webs, Ecological pyramids. 3.To know production and productivity in ecosystem. 4. Knowledge about Biogeochemical cycling (carbon, nitrogen and Phosphorous	1. What is ecosystem? 2. Deference between food chain and food webs. 3. Define Bio-geo-chemical cycle. 4. What is De nitrification.	P.M.	Lecture

				cycle).			
		5.	Phytogeography	1.To know the principle of biogeographical zone. 2. Knowing about Endemism.	Write the definition of Endemism.	P.M.	Lecture
		6.	Introduction to plant Taxonomy	To know about Identification, classification and Nomenclature	1. What is Taxonomy? 2. who coined the name taxonomy	P.M.	Lecture
		7.	Identification	1. Knowledge about Herbarium. 2. Knowing the Functions and Important of herbarium and botanical gardens of the world and India 3. Larne about Documentation Flora, Keys.	1. What is the Measurement of Herbarium shit? 2. Which is the largest Botanical Garden in India and world. 3. What is Flora?	G.M.	Lecture
		8.	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data	To know about Palynology, cytology, phytochemistry and molecular data	1.What is Palynology? 2. What is cytology?	G.M.	Lecture
		9.	Taxonomic hierarchy	1.Knowledge about Ranks, categories and taxonomic groups	1.What is Taxonomic hierarchy? 2. What is Lineal hierarchy? 3. What is Rank?	G.M.	Lecture

		10.	Botanical nomenclature	1. To know about Principles and rules of ICN. 2. Learn about binominal system. 3. Knowing about typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	1.What is binomial nomenclature ? 2. What is author citation and valid publication?	G.M.	Lecture
		11.	Classification	1.Knowing about Types of classification- artificial, natural and phylogenetic. 2. To learn Bentham and Hooker, Engler and Prantl classification	What is classification?	G.M.	Lecture
		12.	Biometrics, numerical taxonomy and cladistics	1. Know about Characters, variations, OTUs, 2. Knowledge about cluster analysis; 3. To learn phenograms, cladograms	1. What is OTUs? 2. Difference between Phenogram and Cladogram.	G.M.	Lecture
	DSC1BP (Plant Ecology and Taxonomy)	1.	Study of morphological adaptations of hydrophytes and xerophytes.	Knowing about morphology of hydrophytes and xerophytes.	Anatomical and Physiological structural diagram of hydrophytes and xerophytes.	G.M.	Demonstration
		2.	Quantitative analysis of herbaceous vegetation in	Know about Raunkiaer's frequency distribution law.	Describe minimum size of Quadrate by Raunkiaer's	G.M.	Demonstration

			the college campus for frequency and comparison with Raunkiaer's frequency distribution law		law.		
		3.	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram, floral formula and systematic position according to Bentham & Hooker's system of classification): Brassicaceae - Brassica, Asteraceae,Vernonia, Tridax; Solanaceae - Solanum nigrum, Lamiaceae - Salvia,	To know about floral diagram, floral formula and systematic position.	Description Floral diagram, floral formula.	G.M.	Demonstration

		4.	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	To know prepare Herbarium.	Submitted herbarium copy in the record book.	G.M.	Lecture

Under Graduate Syllabus (General) 3 Tier Examination Pattern

Type	Paper	Section	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
Part- II							
	II. Theory	I.	a) Anatomy	1.Knowledge about ultra structure of Plant cell wall. 2. Knowing Composition and function of Tissue Meristamatic and Permanent. 3. Know about Stele, Definition, types with example. 4. Learn Normal Secondary growth in dicot stem. Stomatal types.	1.Write the composition of cell wall. 2. Deference between Meristemitic and permanent tissue 3. What is haplostele?	P.M.	Lecture
			b) Ecology	1. Brief knowledge on biosphere and biome, ecotype, Climatic factors, Plant succession, Stages of succession like Xerosere and Hydrosere. 2. Know about Ecological adaptations of hydrophyte, halophyte and Xerophyte. 3. To know Carbon	1.What is Biome? 2. What is ecosystem? 3. What is succession? 4. Define algal bloom? 5. What is BOD & COD? 6.What is SPM?	G.M.	Lecture

				and nitrogen cycle. 4. Knowledge about Air and water pollution: Causes and adverse effects.			
			c) Ethno botany	Give Concept of ethnobotany and significance of its study.	1.What is Ethno botany? 2. Write two significances of Ethno botany	P.M.	Lecture
		II	Cell biology & Genetics:	1.Knowing about Cell cycle with different phages of Mitosis and meiosis. 2.Learn about significance of Mitosis and miosis 3.Knowing Mendelism: Monohybrid and dihybrid cross, test cross, chromosomal basis of Mendelian inheritance. 4. Learn about allelic and non-allelic interactions. 5.Know about Linkage and Crossing over three-point test cross. 6.Give knowledge about Chromosome it's morphology, chemical constituents. DNA structure. 7. Knowledge about chromosomal abortion. 8. Learn about Gene mutation& genetic code.	1.Write two significance of miosis. 2.What is test cross? 3. What is crossing over? 4. Define Euploidy. 5. role of polyploidy in evolution.	G.M.	Lecture

		III	a) Plant Physiology	1.To know about Water relation, Osmotic pressure, turgor pressure, water potential, Ascent of sap. 2. Knowing about Transpiration and its significance, guttationandAntitranspirant. 3. knowing the role of Mineral nutrition 4. To know about Enzymestypes and its properties. 5. Brief knowledge about Photosynthesis, C4 and CAM pathway. 6. To learn about respiration and Nitrogen metabolism 7. Learn about Plant hormones and its role in plant growth and developments. 8. To know about Photoperiodism.	1.What is osmotic Pressure? 2. What is the significance of Transpiration 3. name two anti transpirant factor. 4. What is apo enzyme and co-enzyme? 5.Write the role of auxin in agriculture.	P.M.	Lecture
			b) Biochemistry	Knowing about Carbohydrate, Proteins and Fats	1.Give example di and oligo saccharides. 2. What is secondary protein?	G.M.	Lecture
	III. Practical	1.	Description and identification	Gaining knowledge about some microscopic specimen.	write the identifying characters of Volvox, Oedogonium, Mucor, Penicillium, Agaricus, Riccia, Funaria, Selaginella	P.M.	Demonstration

					and Pteris.		
		2.	Morphology	Gaining knowledge about different types of stipules, inflorescences and fruits.	Describe inflorescences of given plant.	P.M.	Demonstration
		3.	Dissection, drawing, description of some angiospermic plants	To know about floral diagram, floral formula	Description Floral diagram, floral formula	G.M.	Demonstration
		4.	Plant physiology experiments	1.Determination of the rate of oxygen evolution during photosynthesis. 2. Determination of the DPD with the help of storage tissue. 3. To determine the transpiration, pull of a twig of mesophytic plant.	1.Determine DPD from potato.	G.M.	Demonstration

Under Graduate Syllabus (General) 3 Tier Examination Pattern

Type	Paper	Unit/Section	Topic	Learning Object	Related question	Teacher	Teaching Methods
Part -III							

	IV (A) (Theoretical)	I	Genetics, Plant Breeding and Biometry.	1. To learn about DNA replication, gene regulation. 2. Knowing about Mendelian laws: incomplete dominance, dominant epistatic 3.Brief idea of - Recombinant DNA, gene cloning, Transgenic plant.	1.What is central dogma? 2. Write law of segregation. 3. what is Recombinant DNA? 4.Write two property of cloning vector.	P.M.	Lecture
				4. Knowledge about hybridization, Heterosis. 5.knowledge of pure line selection, mass selection and clonal selection. 6. Goodness off it (Chi-square test). 7.Learn about Plant tissue culture and Application of plant tissue culture in the improvement of crop plants.	1.Define Hybridization and heterosis. 2.What is totipotency ? 3. What is tissue culture?	G.M	Lecture
		II	Medicinal plants, Floriculture , Plant protection, Plant propagation.	1.General knowledge about the cultivation and uses of medicinal plants. 2. to learn about classification of ornamental plants 3. Knowing the methods of cultivation and propagation of Rose, Tuberose and Jasmine. 4. Learn about Type	1.Name two medicinal plant and its uses. 2.What is stock and cion? 3. What is Grafting?	G.M.	Lecture

				of plant protection. 5. Knowledge about procedures for cutting, grafting, budding and layering with reference to economical plants.			
		III	Mushroom culture, Biofertilizer.	1.Knowing Cultivation technique of mushrooms and its food value. 2. Give idea of production and applications ofRhizobium, BGA and Azolla. 3. Knowing Significance of biofertilizers over chemical fertilizers.	1.Describe the food value of mushroom. 2. What is biofertilizer ? 3.Write significance of bio fertilizer.	P.M.	Lecture
		IV	Seed preservation, Biodiversity.	1.Knowing General principle of seed storage; concept of modern techniques of seed storage. 2. Brief knowledge about Biodiversity, in-situ and ex-situ conservation. 3. Learn the Methods of in-situ conservation of threatened plants	1.Whate is biodiversity ? 2. Differentiate between Ex-situ & in-situ conservation	G.M.	Lecture
	IV B (Practical)	1.	Preparation of solutions	Learn to Preparation of Sucrose solutions Normal, Molar, Molal, Percentage	Describe the molar percentage of Sucrose.	P.M.	Demonstration
		2.	Identification of medicinal plants.	Knowing about medicinal plant and its importance.	Describe importance of medicinal plant	G.M.	Demonstration
		3.	Bacterial staining	Learn about Bacterial staining from curd.	Prepare a slide from curd and Identify gm Ve+ bacteria	P.M	Demonstration

		4.	Determination of goodness of fit.	Know about goodness of fit of normal monohybrid ratios.	Determination of goodness of fit of monohybrid ratios (3: 1) by Chi-square method.	G.M.	Demonstration

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			b) Bacteria.	To Know About cell structure, Reproduction and economic importance	1.What is plasmid? 2. What is Mesosome? What is Genophore?	P.M.	Lecture
		2.	Algae	1. General knowledge about algae. 2.Classification of algae 3.Economic importance of algae	1.What is Thallus? 2. Example an algae which is rich in protein. 3. What is the importance of algae in medicine.	G.M.	Lecture

		3.	Fungi	1.To know about General characteristics of Fungi 2. Knowing reproduction and classification. 3. Knowledge about Nutrition. 4. To know about Symbiotic Associations of Lichens Mycorrhiza.	1. What are true Fungi? 2. Name two edible and poisonous mushroom. 3. What is dolipore septum?	P.M.	Lectu re
		4.	Introductio n to Archegonia te	1.To know about Archegoniate. 2. Knowledge about Alternation of generation.	1. What is Archegoniate ? 2. Define Alternation of generation	P.M.	Lectu re
		5.	Bryophytes	1.Knowing general characteristics, classification of Bryophytes 2. Knowledge about Morphology, anatomy, and Reproduction of Marchantia and Funaria. 3. Know about Ecological importance of bryophytes (Sphagnum)	1. Why Bryophytes are calling amphibian? 2. Write the importance of bryophytes.	P.M.	Lectu re
		6.	Pteridophy tes	1.Knowing about Early land plant 2. Knowing about Morphology, anatomy and Reproduction of selaginella, Equisetum and Pteris. 3. Knowledge	1.what is Heterospory ? 2. What is the importance of Selaginella?	G.M.	Lectu re

				about stelar evolution.			
		7.	Gymnosperm	1. To know General characteristics of gymnosperm. 2. Knowing about morphology, anatomy and reproduction of Cycas and Pinus. 3. Ecological and economical importance.	1.What is Coralloid root? What is the importance of Gymnosperm	G.M.	Lecture
	DSC-C1P Biodiversity (Microbes, Algae, Fungi and Archegoniate (Practical)	1.	Models of TMV-viruses	Knowing about Viruses	Draw structures and label its part.	G.M.	Demonstration
		3.	Agaricus	Study about Sectioning of gills of Agaricus	Write the identifying characters of Agaricus and draw its fruit body with label.	P.M.	Demonstration
		4.	Selaginella	Know about morphology and strobilus of Selaginella.	Draw and label Strobilus of Selaginella.	P.M.	Demonstration
		5.	Pteris	Knowing about Morphology, rachis and spore of Pteris	Write the characteristics of Pteris.	G.M.	Demonstration

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods

SEMESTER-II							
CC-II	DSC1B(C2T): Plant Ecology and Taxonomy	1.	Introduction	To know about Ecology.	1.What is ecology? 2. who coined the name ecology	S.M.	Lecture
		2.	Ecological factors	1.Knowing about Soil and its formation. 2. To know about soil profile. 3. Knowledge about States of water in the environment, precipitation types. 4. Knowing Light and temperature 5. Know about Shelford law of tolerance. 6. Know about Adaptation of hydrophytes and xerophytes.	1.What is soil profile? 2.What is capillary water? 3. What is Shelford law? 4. Name two xerophytic plant.	S.M.	Lecture
		3.	Plant communities	1.To know about Ecotone and edge effect 2.Knowledge about Succession, Processes and types.	1. What is ecotone and edge effect? 2. What is the pioneer of xerosere? 3. what is sere?	S.M.	Lecture
		4.	Ecosystem	1. To know about ecosystem, energy flow trophic organization. 2. Knowing Food chains and	1. What is ecosystem? 2. Deference between food chain and food webs. 3. Define Bio-geo-chemical	S.M.	Lecture

				food webs, Ecological pyramids. 3.To know production and productivity in ecosystem. 4. Knowledge about Biogeochemical cycling (carbon, nitrogen and Phosphorous cycle).	cycle. 4. What is De nitrification.		
		5.	Phytogeography	1.To know the principle of biogeographical zone. 2. Knowing about Endemism.	Write the definition of Endemism.	S.M.	Lecture
		6.	Introduction to plant Taxonomy	To know about Identification, classification and Nomenclature	1. What is Taxonomy? 2. who coined the name taxonomy	S.M.	Lecture
		7.	Identification	1. Knowledge about Herbarium. 2. Knowing the Functions and Important of herbarium and botanical gardens of the world and India 3. Larne about Documentation Flora, Keys.	1. What is the Measurement of Herbarium shit? 2. Which is the largest Botanical Garden in India and world. 3. What is Flora?	G.M.	Lecture
		8.	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data	To know about Palynology, cytology, phytochemistry and molecular data	1.What is Palynology? 2. What is cytology?	G.M.	Lecture

		9.	Taxonomic hierarchy	1.Knowledge about Ranks, categories and taxonomic groups	1.What is Taxonomic hierarchy? 2. What is Lineal hierarchy? 3. What is Rank?	G.M.	Lecture
		10.	Botanical nomenclature	1. To know about Principles and rules of ICN. 2. Learn about binominal system. 3. Knowing about typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	1.What is binomial nomenclature ? 2. What is author citation and valid publication?	G.M.	Lecture
		11.	Classification	1.Knowing about Types of classification- artificial, natural and phylogenetic. 2. To learn Bentham and Hooker, Engler and Prantl classification	What is classification?	G.M.	Lecture
		12.	Biometrics, numerical taxonomy and cladistics	1. Know about Characters, variations, OTUs, 2. Knowledge about cluster analysis; 3. To learn phenograms, cladograms	1. What is OTUs? 2. Difference between Phenogram and Cladogram.	G.M.	Lecture

	DSC1BP (Plant Ecology and Taxonomy)	1.	Study of morphological adaptations of hydrophytes and xerophytes.	Knowing about morphology of hydrophytes and xerophytes.	Anatomical and Physiological structural diagram of hydrophytes and xerophytes.	G.M.	Demonstration
		2.	Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law	Know about Raunkiaer's frequency distribution law.	Describe minimum size of Quadrate by Raunkiaer's law.	G.M.	Demonstration
		3.	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram, floral formula and systematic position according to Bentham & Hooker's system of classification): Brassicaceae - Brassica, Asteraceae,Vernonia, Tridax; Solanaceae - Solanum nigrum,	To know about floral diagram, floral formula and systematic position.	Description Floral diagram, floral formula.	G.M.	Demonstration

			Liliaceae - Salvia,				
		4.	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	To know prepare Herbarium.	Submitted herbarium copy in the record book.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER-III							
CC3	DSC-1CT Plant Anatomy and Embryology	1.	Meristematic and permanent tissues	1.To knowing aboutRoot and shoot apical meristems. 2. Learn About Simple and complex tissues.	1.Deferencia t between Simple and Complex tissue 2. What is Root apex?	G.M.	Lecture
		2.	Organs	Knowledge about Structure of dicot and monocot root, stem and leaf.	Deference between monocot and dicot root.	G.M.	Lecture
		3.	Secondary Growth	1. General knowledge about Vascular cambium. 2. Know about Secondary growth in root and stem, Wood.	1.Write the function of vascular cambium. 2. What is Heart wood?	G.M.	Lecture
		4.	Adaptive and protective systems	1.Gain Knowledge aboutAdaptive and Protective system of plant. 2. Knowing about adaptations in xerophytes and hydrophytes.	1.Write a note about stomata. 2. What is the function of epidermis?	P.M.	Lecture

		5.	Structural organization of flower	1. Know about Structure of anther and pollen. 2. Knowing the types of ovules. 3. Learn about embryo sacs.		P.M.	Lecture
		6.	Pollination and fertilization	1. Knowledge about Pollination and adaptations 2. Brief Knowledge about Double fertilization. 3. Learn about Seed dispersal mechanisms.	1.What is pollination? 2. What is allogamy? 3. Deference between cross & self-pollination.	P.M.	Lecture
		7.	Embryo and endosperm	1. Knowledge about Endosperm 2. Learn about Dicot and monocot embryo.	1.What is embryo? 2. What is the Function of Endosperm?	G.M.	Lecture
		8.	Apomixis and polyembryony	Gain knowledge about Apomixis and polyembryonyan dits practical applications.	1. What is polyembryony. 2. Mention the application of polyembryony	P.M.	Lecture
	DSC1CP: Plant Anatomy and Embryology (Practical)	1.	Study of meristems through permanent slides	Gain knowledge about Meristem.	Write about meristem.	G.M.	Demonstration
		2.	Stem	Learn about monocot stem.	Write characters of monocot stem.	P.M.	Demonstration
		3.	Adaptive anatomy of Xerophyte	Learn about Xerophytic and Hydrophyt	Write the Xerophytic adaptation	G.M.	Demonstration

			and Hydrophyte	Adaptation.	of Hydrilla.		
		4.	Types of ovules.	Know about Ovules of various types.	Describe anatropous and camphylotropous ovules.	G.M.	Demonstration
	SEC-1: Bio-fertilizers	1.	General account about the microbes used as bio fertilizer (Rhizobium)	Learn about Microbes used in bio fertilizer.	1.How isolat Rhizobium? 2. Write uses of Bio fertilizer	G.M.	Lecture
		2.	Azospirillum Azotobacter	1. Know to isolation of Azospirillum. 2. Learn about Azotobactor it's characteristic and cropresponse.	1. What is crop response of Azotobactor ?	G.M.	Lecture
		3.	Cyanobacteria (blue green algae), Azolla and Anabaena	1. Knowing about Cyanobacteria, Azola and Anabaena 2. Know about Nitrogen fixation by Azolla. 3. Learn about the function of blue green algae & azolla in cultivation of rice.	1. What areCyanobacteria? 2. How nitrogen fixed by blue green algae? 3. Write the role of azolla in rice cultivation.	P.M.	Lecture
		5.	Mycorrhizal association, VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	1. Learn about Mycoriza,VAM. 2. Knowing VAM to influence on growth and yield of crop plants.	1.What is VAM? 2. Write the function of VAM in crop plant.	P.M.	Lecture

		6.	Organic farming green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – bio compost making methods, types and method of vermicomposting – field Application.	1.Knowing about organic farming. 2. Learn about organic Fertilizer. 3. Knowing about Recycling of biodegradable wastes. 4. Learn to making of vermicompost and its used.	1.What is organic farming? 2. How recycle biodegradable wastes? 3. Write the application of vermicompost?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-IV							
CC-4	DSC1DT(C4T): Plant Physiology and Metabolism	1.	Plant-water relations	1.Knowing about Importance of water, water potential and its components 2. Get knowledge about Transpiration and its significance. 3. Know about Factors affecting transpiration. 4. Knowledge about Root pressure and guttation.	1. Write importance of water in leaving organs. 2. What is the significance of transpiration in plant? 3. Deference between Transpiration & guttation	G.M.	Lecture
		2.	Mineral nutrition	1. Learn about Essential elements, macro and micronutrients. 2. Knowing Role of	1.Define micro and macro nutrients with example. 2. Describe the	S.M.	Lecture

				essential elements. 3. Get knowledge about Transport of ions across cell membrane 4. Learn about active and passive transport.	role of essential elements in plant. 3. Deference between active andpassive transport.		
		3.	Translocation in phloem	1. Knowing about Composition of phloem sap. 2. To know Pressure flow model. 3. Get knowledge about Phloem loading and unloading	1.What is Phloem sap? 2. Define apoplast pathway?	G.M.	Lecture
		4.	Photosynthesis	1. Knowing Photosynthetic Pigments (Chl a, b, xanthophylls, carotene). 2. Get knowledge about Photosystem I and II, reaction center, antenna molecules. 4. Knowing Electron transport and mechanism of ATP synthesis. 4. Knowledge about C3, C4 and CAM pathways of carbon fixation. 5. Learn about Photorespiration.	1. Define Photosynthesis. 2. What are antenna molecules? 3. Describe ATP synthesis. 4. Write about CAM pathway.	G.M.	Lecture
		5.	Respiration	1. Know about Glycolysis, anaerobic respiration, TCA cycle. 2. Knowledge about Oxidative phosphorylation, Glyoxylate. 3. Learn about Oxidative Pentose	1. What is Glycolysis? 2. Write a short note of TCA cycle. 3. What is PPP?	G.M.	Lecture

				Phosphate Pathway.			
		6.	Enzymes	1.Learn about Structure and properties of enzyme. 2. Mechanism of enzyme catalysis and enzyme inhibition.	1.	S.M.	Lecture
		7.	Nitrogen metabolism	Know about Biological nitrogen fixation.	1.What is Nef gen and nod gene? 2. Name two nitrogen fixing bacteria. 3. What is ammonificatio n?	G.M.	Lecture
		8.	Plant growth regulators	Learn about Discovery and physiological roles of auxins, gibberellins, cytokinin, ABA, ethylene.	1.What is PGRs? 2. Write the role of ABA in stress condition in plant. 3. what is triple response	S.M.	Lecture
		9.	Plant response to light and temperature	1.Learn about Photoperiodism. 2.Knoledge about Phytochromeand Vernalization.	1. What is vernalization? 2. Describe phytochrome. 3. What is SDP?	S.M.	Lecture
	DSC-1DP-Plant Physiol ogy and Metab olism (Practi	1.	Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.	Knowledge about Stomatal Index and it's frequency.	Calculate stomatal Index of a mesophyte plant.	G.M.	Demons tration
		2.	Demonstration of Hill reaction	Learn about Hill Reaction.	Demonstratio n of Hill reaction.	P.M.	Demons tration

	cal)	3.	Effect of auxins on rooting.	Know about auxin as PGRs	Demonstratio n of rootin	G.M.	Demons tration
		4.	Determination of osmotic potential of plant cell sap by plasmolytic method.	Knowing about Plasmolytic Methods.	Determination of osmotic potential of plant cell sap by plasmolytic method.	P.M.	Demons tration
		5.	R.Q.	Knowing about R.Q.	Demonstratio n of R.Q.	P.M.	Demons tratio
	SEC3T Floricu lture	1.	Introduction	Know about gardening, Importance and scope of floriculture		G.M	Lecture
		2.	Nursery Management and Routine Garden Operations	1.Learn about Sexual and vegetative methods of propagation. 2. knowing Soil sterilization, Seed sowing, Planting and Mulching. 3. Gain knowledge about Role of plant growth regulators.		S.M.	Lecture
		3.	Ornamental Plants	1. Learn about ornamental trees, Ornamental bulbous and foliage plants. 2. Knowing Cultivation of plants in pots; Indoor gardening; Bonsai.	1. Write two names of succulent plant. 2. What is ornamental tree?	S.M	Lecture
		4.	Principles of Garden Designs	1.Gain knowledge about English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden. 2. Know about Some Famous gardens of India.	1.Describe about Flower beds. 2. Named some famous garden in India.	S.M.	Lecture
		5.	Landscaping Places of Public Importance	Learn about Landscaping highways and educational institutions.		G.M.	Lecture

		6.	Commercial Floriculture	1. Learn the Factors affecting flower production. 2.Know about Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life. 3. Get knowledge about Cultivation of Important cut flowers.	1 How Gerbera and Aster are cultivated? 2. How factors are affecting on flowering plant?	G.M.	Lecture
		7.	Diseases and Pests of Ornamental Plants.	Know about ornamental plant Diseases and its pests.		G.M.	Lecture

Under Graduate Syllabus (General) 3 Tier Examination Pattern

Type	Paper	Unit/Section	Topic	Learning Object	Related question	Teacher	Teaching Methods
				Part -III			
	IV (A) (Theoretical)	I	Genetics, Plant Breeding and Biometry.	1. To learn about DNA replication, gene regulation. 2. Knowing about Mendelian laws: incomplete dominance, dominant epistatic 3.Brief idea of - Recombinant DNA, gene cloning, Transgenic plant.	1.What is central dogma? 2. Write law of segregation. 3. what is Recombinant DNA? 4.Write two property of cloning vector.	P.M.	Lecture

				4. Knowledge about hybridization, Heterosis. 5.knowledge of pure line selection, mass selection and clonal selection. 6. Goodness off it (Chi-square test). 7.Learn about Plant tissue culture and Application of plant tissue culture in the improvement of crop plants.	1.Define Hybridizatio n and heterosis. 2.What is totipotency ? 3. What is tissue culture?	G.M	Lecture
		II	Medicinal plants, Floriculture , Plant protection, Plant propagatio n.	1.General knowledge about the cultivation and uses of medicinal plants. 2. to learn about classification of ornamental plants 3. Knowing the methods of cultivation and propagation of Rose, Tuberose and Jasmine. 4. Learn about Type of plant protection. 5. Knowledge about procedures for cutting, grafting, budding and layering with reference to economical plants.	1.Name two medicinal plant and its uses. 2.What is stock and cion? 3. What is Grafting?	G.M.	Lecture
		III	Mushroom culture, Biofertilizer .	1.Knowing Cultivation technique of mushrooms and its food value. 2. Give idea of production and applications ofRhizobium, BGA and Azolla. 3. Knowing Significance of biofertilizers over	1.Describe the food value of mushroom. 2. What is biofertilizer ? 3.Write significance of bio fertilizer.	P.M.	Lecture

				chemical fertilizers.			
		IV	Seed preservation, Biodiversity.	1.Knowing General principle of seed storage; concept of modern techniques of seed storage. 2. Brief knowledge about Biodiversity, in-situ and ex-situ conservation. 3. Learn the Methods of in-situ conservation of threatened plants	1.Whate is biodiversity ? 2. Differentiate between Ex-situ & in-situ conservation	G.M.	Lecture
	IV B (Practical)	1.	Preparation of solutions	Learn to Preparation of Sucrose solutions Normal, Molar, Molal, Percentage	Describe the molar percentage of Sucrose.	P.M.	Demonstration
		2.	Identification of medicinal plants.	Knowing about medicinal plant and its importance.	Describe importance of medicinal plant	G.M.	Demonstration
		3.	Bacterial staining	Learn about Bacterial staining from curd.	Prepare a slide from curd and Identify gm Ve+ bacteria	S.M	Demonstration
		4.	Determination of goodness of fit.	Know about goodness of fit of normal monohybrid ratios.	Determination of goodness of fit of monohybrid ratios (3: 1) by Chi-square method.	G.M.	Demonstration

Lesson Plan for (CBCS General) for the Academic Session 2020-2021

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods

SEMESTER-I							
CC-I	DSC-1AT Biodiversity	1.	a) Viruses.	To know about Structure, Type and Economic importance of Viruses.	1. What is virion? 2. Give example DNA & RNA viruses	G.M.	Lecture
			b) Bacteria.	To Know About cell structure, Reproduction and economic importance	1.What is plasmid? 2. What is Mesosome? What is Genophore?	S.M.	Lecture
		2.	Algae	1. General knowledge about algae. 2.Classification of algae 3.Economic importance of algae	1.What is Thallus? 2. Example an algae which is rich in protein. 3. What is the importance of algae in medicine.	G.M.	Lecture
		3.	Fungi	1.To know about General characteristics of Fungi 2. Knowing reproduction and classification. 3. Knowledge about Nutrition. 4. To know about Symbiotic Associations of Lichens Mycorrhiza.	1. What are true Fungi? 2. Name two edible and poisonous mushroom. 3. What is dolipore septum?	S.M.	Lecture
		4.	Introduction to Archegoniate	1.To know about Archegoniate. 2. Knowledge about Alternation of generation.	1. What is Archegoniate? 2 Define Alternation of generation	S.M.	Lecture

		5.	Bryophytes	1.Knowing general characteristics, classification of Bryophytes 2. Knowledge about Morphology, anatomy, and Reproduction of Marchantia and Funaria. 3. Know about Ecological importance of bryophytes (Sphagnum)	1. Why Bryophytes are calling amphibian? 2. Write the importance of bryophytes.	S.M.	Lectu re
		6.	Pteridophy tes	1.Knowing about Early land plant 2. Knowing about Morphology, anatomy and Reproduction of selaginella, Equisetum and Pteris. 3. Knowledge about stelar evolution.	1.what is Heterospory ? 2. What is the importance of Selaginella?	G.M.	Lectu re
		7.	Gymnosper m	1. To know General characteristics of gymnosperm. 2. Knowing about morphology, anatomy and reproduction of Cycas and Pinus. 3. Ecological and economical importance.	1.What is Coralloid root? What is the importance of Gymnosperm	G.M.	Lectu re
	DSC-C1P Biodiversity (Microbes, Algae, Fungi and Archegoniate	1.	Models of TMV-viruses	Knowing about Viruses	Draw structures and label its part.	G.M.	Dem onstr ation

	(Practical)						
		2.	Study of vegetative and reproductive structures of algae	Gain knowledge about reproductive structures of Nostoc, Oedogonium, Vaucheria	Write the identifying characters of vaucheria.	G.M.	Demonstration
		3.	Agaricus	Study about Sectioning of gills of Agaricus	Write the identifying characters of Agaricus and draw its fruit body with label.	S.M.	Demonstration
		4.	Selaginella	Know about morphology and strobilus of Selaginella.	Draw and label Strobilus of Selaginella.	S.M.	Demonstration
		5.	Pteris	Knowing about Morphology, rachis and spore of Pteris	Write the characteristics of Pteris.	G.M.	Demonstration

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-II							
CC-II	DSC1B(C2T): Plant Ecology and Taxonomy	1.	Introduction	To know about Ecology.	1.What is ecology? 2. who coined the name ecology	S.M.	Lecture

		2.	Ecological factors	1.Knowing about Soil and its formation. 2. To know about soil profile. 3. Knowledge about States of water in the environment, precipitation types. 4. Knowing Light and temperature 5. Know about Shelford law of tolerance. 6. Know about Adaptation of hydrophytes and xerophytes.	1.What is soil profile? 2.What is capillary water? 3. What is Shelford law? 4. Name two xerophytic plant.	S.M.	Lecture
		3.	Plant communities	1.To know about Ecotone and edge effect 2.Knowledge about Succession, Processes and types.	1. What is ecotone and edge effect? 2. What is the pioneer of xerosere? 3. what is sere?	S.M.	Lecture
		4.	Ecosystem	1. To know about ecosystem, energy flow trophic organization. 2. Knowing Food chains and food webs, Ecological pyramids. 3.To know production and productivity in ecosystem. 4. Knowledge about	1. What is ecosystem? 2. Deference between food chain and food webs. 3. Define Bio-geo-chemical cycle. 4. What is De nitrification.	S.M.	Lecture

				Biogeochemical cycling (carbon, nitrogen and Phosphorous cycle).			
		5.	Phytogeography	1.To know the principle of biogeographical zone. 2. Knowing about Endemism.	Write the definition of Endemism.	S.M.	Lecture
		6.	Introduction to plant Taxonomy	To know about Identification, classification and Nomenclature	1. What is Taxonomy? 2. who coined the name taxonomy	S.M.	Lecture
		7.	Identification	1. Knowledge about Herbarium. 2. Knowing the Functions and Important of herbarium and botanical gardens of the world and India 3. Larne about Documentation Flora, Keys.	1. What is the Measurement of Herbarium shit? 2. Which is the largest Botanical Garden in India and world. 3. What is Flora?	G.M.	Lecture
		8.	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data	To know about Palynology, cytology, phytochemistry and molecular data	1.What is Palynology? 2. What is cytology?	G.M.	Lecture
		9.	Taxonomic hierarchy	1.Knowledge about Ranks, categories and taxonomic groups	1.What is Taxonomic hierarchy? 2. What is Lineal hierarchy? 3. What is Rank?	G.M.	Lecture

		10.	Botanical nomenclature	1. To know about Principles and rules of ICN. 2. Learn about binominal system. 3. Knowing about typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	1.What is binomial nomenclature ? 2. What is author citation and valid publication?	G.M.	Lecture
		11.	Classification	1.Knowing about Types of classification- artificial, natural and phylogenetic. 2. To learn Bentham and Hooker, Engler and Prantl classification	What is classification?	G.M.	Lecture
		12.	Biometrics, numerical taxonomy and cladistics	1. Know about Characters, variations, OTUs, 2. Knowledge about cluster analysis; 3. To learn phenograms, cladograms	1. What is OTUs? 2. Difference between Phenogram and Cladogram.	G.M.	Lecture

	DSC1BP (Plant Ecology and Taxonomy)	1.	Study of morphological adaptations of hydrophytes and xerophytes.	Knowing about morphology of hydrophytes and xerophytes.	Anatomical and Physiological structural diagram of hydrophytes and xerophytes.	G.M.	Demonstration
		2.	Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law	Know about Raunkiaer's frequency distribution law.	Describe minimum size of Quadrate by Raunkiaer's law.	G.M.	Demonstration
		3.	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram, floral formula and systematic position according to Bentham & Hooker's system of classification): Brassicaceae - Brassica, Asteraceae, Vernonia, Tridax; Solanaceae - Solanum nigrum,	To know about floral diagram, floral formula and systematic position.	Description Floral diagram, floral formula.	G.M.	Demonstration

			Liliaceae - Salvia,				
		4.	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	To know prepare Herbarium.	Submitted herbarium copy in the record book.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER-III							
CC3	DSC-1CT Plant Anatomy and Embryology	1.	Meristematic and permanent tissues	1.To knowing about Root and shoot apical meristems. 2. Learn About Simple and complex tissues.	1.Deferencia t between Simple and Complex tissue 2. What is Root apex?	G.M.	Lecture
		2.	Organs	Knowledge about Structure of dicot and monocot root, stem and leaf.		G.M.	Lecture
		3.	Secondary Growth	1. General knowledge about Vascular cambium. 2. Know about Secondary growth in root and stem, Wood.	1.Write the function of vascular cambium. 2. What is Heart wood?	G.M.	Lecture
		4.	Adaptive and protective systems	1.Gain Knowledge about Adaptive and Protective system of plant. 2. Knowing about adaptations in xerophytes and hydrophytes.	1.Write a note about stomata. 2. What is the function of epidermis?	S.M.	Lecture

		5.	Structural organization of flower	1. Know about Structure of anther and pollen. 2. Knowing the types of ovules. 3. Learn about embryo sacs.		S.M.	Lecture
		6.	Pollination and fertilization	1. Knowledge about Pollination and adaptations 2. Brief Knowledge about Double fertilization. 3. Learn about Seed dispersal mechanisms.	1.What is pollination? 2. What is allogamy? 3. Deference between cross & self-pollination.	S.M.	Lecture
		7.	Embryo and endosperm	1. Knowledge about Endosperm 2. Learn about Dicot and monocot embryo.	1.What is embryo? 2. What is the Function of Endosperm?	G.M.	Lecture
		8.	Apomixis and polyembryony	Gain knowledge about Apomixis and polyembryonyan dits practical applications.	1. What is polyembryony. 2. Mention the application of polyembryony	S.M.	Lecture
	DSC1CP: Plant Anatomy and Embryology (Practical)	1.	Study of meristems through permanent slides	Gain knowledge about Meristem.	Write about meristem.	G.M.	Demonstration
		2.	Stem	Learn about monocot stem.	Write characters of monocot stem.	S.M.	Demonstration
		3.	Adaptive anatomy of Xerophyte	Learn about Xerophytic and Hydrophyt	Write the Xerophytic adaptation	G.M.	Demonstration

			and Hydrophyte	Adaptation.	of Hydrilla.		
		4.	Types of ovules:	Know about Ovules of various types.	Describe anatropous and camphylotropous ovules.	G.M.	Demonstration
	SEC-1: Bio-fertilizers	1.	General account about the microbes used as bio fertilizer (Rhizobium)	Learn about Microbes used in bio fertilizer.	1. How isolat Rhizobium? 2. Write uses of Bio fertilizer	G.M.	Lecture
		2.	Azospirillum Azotobacter	1. Know to isolation of Azospirillum. 2. Learn about Azotobactor it's characteristic and crop response.	1. What is crop response of Azotobactor ?	G.M.	Lecture
		3.	Cyanobacteria (blue green algae), Azolla and Anabaena	1. Knowing about Cyanobacteria, Azola and Anabaena 2. Know about Nitrogen fixation by Azolla. 3. Learn about the function of blue green algae & azolla in cultivation of rice.	1. What are Cyanobacteria? 2. How nitrogen fixed by blue green algae? 3. Write the role of azolla in rice cultivation.	S.M.	Lecture
		5.	Mycorrhizal association, VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	1. Learn about Mycoriza,VAM. 2. Knowing VAM to influence on growth and yield of crop plants.	1.What is VAM? 2. Write the function of VAM in crop plant.	S.M.	Lecture

		6.	Organic farming green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.	1. Knowing about organic farming. 2. Learn about organic Fertilizer. 3. Knowing about Recycling of biodegradable wastes. 4. Learn to making of vermicompost and its used.	1.What is organic farming? 2. How recycle biodegradable wastes? 3. Write the application of vermicompost?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-IV							
CC-4	DSC1DT(C4T): Plant Physiology and Metabolism	1.	Plant-water relations	1.Knowing about Importance of water, water potential and its components 2. Get knowledge about Transpiration and its significance. 3. Know about Factors affecting transpiration. 4. Knowledge about Root pressure and guttation.	1. Write importance of water in leaving organs. 2. What is the significance of transpiration in plant? 3. Deference between Transpiration & guttation	G.M.	Lecture
		2.	Mineral nutrition	1. Learn about Essential elements, macro and micronutrients. 2. Knowing Role of	1.Define micro and macro nutrients with example. 2. Describe the	S.M.	Lecture

				essential elements. 3. Get knowledge about Transport of ions across cell membrane 4. Learn about active and passive transport.	role of essential elements in plant. 3. Deference between active and passive transport.		
		3.	Translocation in phloem	1. Knowing about Composition of phloem sap. 2. To know Pressure flow model. 3. Get knowledge about Phloem loading and unloading	1.What is Phloem sap? 2. Define apoplast pathway?	G.M.	Lecture
		4.	Photosynthesis	1. Knowing Photosynthetic Pigments (Chl a, b, xanthophylls, carotene). 2. Get knowledge about Photosystem I and II, reaction center, antenna molecules. 4. Knowing Electron transport and mechanism of ATP synthesis. 4. Knowledge about C3, C4 and CAM pathways of carbon fixation. 5. Learn about Photorespiration.	1. Define Photosynthesis. 2. What are antenna molecules? 3. Describe ATP synthesis. 4. Write about CAM pathway.	G.M.	Lecture
		5.	Respiration	1. Know about Glycolysis, anaerobic respiration, TCA cycle. 2. Knowledge about Oxidative phosphorylation, Glyoxylate. 3. Learn about Oxidative Pentose	1. What is Glycolysis? 2. Write a short note of TCA cycle. 3. What is PPP?	G.M.	Lecture

				Phosphate Pathway.			
		6.	Enzymes	1.Learn about Structure and properties of enzyme. 2. Mechanism of enzyme catalysis and enzyme inhibition.	1.	S.M.	Lecture
		7.	Nitrogen metabolism	Know about Biological nitrogen fixation.	1.What is Nef gen and nod gene? 2. Name two nitrogen fixing bacteria. 3. What is ammonificatio n?	G.M.	Lecture
		8.	Plant growth regulators	Learn about Discovery and physiological roles of auxins, gibberellins, cytokinin, ABA, ethylene.	1.What is PGRs? 2. Write the role of ABA in stress condition in plant. 3. what is triple response	S.M.	Lecture
		9.	Plant response to light and temperature	1.Learn about Photoperiodism. 2.Knoledge about Phytochromeand Vernalization.	1. What is vernalization? 2. Describe phytochrome. 3. What is SDP?	S.M.	Lecture
	DSC-1DP-Plant Physiol ogy and Metab olism (Practi	1.	Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.	Knowledge about Stomatal Index and it's frequency.	Calculate stomatal Index of a mesophyte plant.	G.M.	Demons tration
		2.	Demonstration of Hill reaction	Learn about Hill Reaction.	Demonstratio n of Hill reaction.	P.M.	Demons tration

	cal)	3.	Effect of auxins on rooting.	Know about auxin as PGRs	Demonstratio n of rooting	G.M.	Demons tration
		4.	Determination of osmotic potential of plant cell sap by plasmolytic method.	Knowing about Plasmolytic Methods.	Determination of osmotic potential of plant cell sap by plasmolytic method.	P.M.	Demons tration
		5.	R.Q.	Knowing about R.Q.	Demonstratio n of R.Q.	P.M.	Demons tratio
	SEC2T: Mushr oom Cultur e Techn ology	1.	Introduction	1.To know Nutritional and medicinal value of edible mushrooms. 2. Learn about Poisonous mushrooms. 3. Get knowledge about types of edible mushrooms available in India.	1. How to defer poisonous mushroom from edible one? 2. Describe the nutritional value of mushroom	G.M	Lecture
		2.	Cultivation Technology	1. Learn about Cultivation technology. 2. Learn about Mushroom bed preparation.	Write a note about preparation of mushroom bed.	G.M.	Lecture
		3.	Storage and nutrition	1. Gain knowledge about Short-term storage and long-term Storage. 2. Know about the nutritional value of mushroom.	1.How we store for long time? 2. Write nutritional value of mushroom.	G.M.	Lecture
		4.	Food Preparation	1. Gain knowledge about Types of foods prepared from mushroom. 2. learn Research Centers - National level and regional level. 3. Knowing the Marketing in India and abroad, Export Value.	Which tipes of food prepared from mushroom?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMISTER-V							
S.M.	DSE1T: Economic Botany and Biotechnology	1.	Origin of Cultivated Plants	1.Gain Concept of centers of origin. 2. Know their importance with reference to Vavilov's work	Mention the concept of 'Vavilov center of crop origin'	G.M.	Lecture
		2.	Cereals	Know about Wheat & its Origin, morphology,uses.	1. What are cereals? 2. Write the uses of wheat.	G.M	Lecture
		3.	Legumes	Gain knowledge with special reference to Gram and soybean	1. Give note about Gram. 2. Write the scientific name of soybean	G.M.	Lecture
		4.	Spices	Learn about clove and black pepper.	1.Write the scientific name and family of clove. 2. Write the uses of black pepper	G.M.	Lecture
		5.	Beverages	Know about morphology, processing and uses of tea	1.What is Oolong tea? 2. Discuss the processing of tea	G.M.	Lecture
		6.	Oils and Fats	Learn about groundnut	1.Write down the botanical name of groundnut. 2. Discuss uses of groundnut.	G.M.	Lecture
		7.	Fibre Yielding Plants	Gain knowledge about Botanical name, family, part used, morphology and uses of cotton.	Write down the Family of Cotton. 2. Mention the uses of cotton in daily life of human beings.	G.M.	Lecture
		8.	Introduction to biotechnology	Knowing about biotechnology and its significance.	1.What is biotechnology? 2. Write the uses of biotechnology.	S.M.	Lecture
		9.	Plant tissue culture	1. Gain knowledge about Micropropagation.	1.What is micropropagation? 2. Write the	S.M.	Lecture

				2. Knowing about haploid production through androgenesis and gynogenesis 3. Learn to brief account of embryo & endosperm culture with their applications	advantage of micropropagation. 3. What is Totipotency?		
		10.	Recombinant DNA Techniques	1. Knowing about Blotting techniques. 2. Learn about DNA Fingerprinting. 3. Gain knowledge about molecular DNA markers i.e. RAPD, RFLP, SNPs. 4. Learn about PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA. 5. Human gene Therapy.	1.Write down a note of Northern blotting. 2. Describe the significance of DNA Fingerprinting. 3. What is DNA marker? 4. Write the full form of RAPD. 5. What is PCR,write it's use. 6.Briefly describe about Humen genTherapy.	S.M.	Lecture
	DSE1P: Economic Botany and Biotechnology (Practical)	1.	Study of economically important plants	Know about Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests		G.M.	Demonstration
		2.	Familiarization with basic equipments in tissue culture	Learn about tissue culture	Describe tissue culture with basic equipment.	G.M.	Demonstration
		3.	Study through photographs	Knowing about Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation	Describe Anther culture with suitable diagram.	S.M.	Demonstration

		4.	Study of molecular techniques	Learn about PCR, Blotting techniques, AGE and PAGE.		S.M.	Demonstration
	SEC3T Floriculture	1.	Introduction	Know about gardening, Importance and scope of floriculture	1.What is floriculture? 2. Write down its scope.	G.M	Lecture
		2	Nursery Management and Routine Garden Operations	1.Learn about Sexual and vegetative methods of propagation. 2. knowing Soil sterilization, Seed sowing, Planting and Mulching. 3. Gain knowledge about Role of plant growth regulators.	1. how sterilize soil for nursery? 2. When we mulching a plant? 3. Describe the role of PGRs.	S.M.	Lecture
		3.	Ornamental Plants	1. Learn about ornamental trees, Ornamental bulbous and foliage plants. 2. KnowingCultivation of plants in pots; Indoor gardening; Bonsai.	1. Write two names of succulent plant. 2. What is ornamental tree?	S.M	Lecture
		4.	Principles of Garden Designs	1.Gain knowledge about English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden. 2. Know about Some Famous gardens of India.	1.Describe about Flower beds. 2. Named some famous garden in India.	S.M.	Lecture
		5.	Landscaping Places of Public Importance	Learn about Landscaping highways and educational institutions.		G.M.	Lecture
		6.	Commercial Floriculture	1. Learn the Factors affecting flower production. 2.Know about Production and packaging of cut	1 How Gerbera and Aster are cultivated? 2. How factors are affecting on flowering plant?	G.M.	Lecture

				flowers; Flower arrangements; Methods to prolong vase life. 3. Get knowledge about Cultivation of Important cut flowers.			
		7.	Diseases and Pests of Ornamental Plants.	Know about ornamental plant Diseases and its pests.	Name some pests of ornamental plant.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER -VI							
	DSE2T: Genetics and Plant Breeding	1.	Heredity	1.Learn brief life history of Mendel and Terminologies 2. Know about Laws of Inheritance, Modified Mendelian Ratios, lethal Genes, Co - dominance, incomplete dominance. 3. Learn about Chi Square, Pedigree Analysis 4. Gain knowledge about Cytoplasmic Inheritance 5.Learn about Multiple allelism, Pleiotropism, Chromosome theory of Inheritance.	1.What is lethal gen? 2. Write down the law of inheritance. 3. Define Co-Dominance and incomplete dominance give example.	G.M.	Lecture
		2.	Sex-determination and Sex-linked Inherita	Knowing about Sex-determination.	Write a note about sex linked inheritance.	S.M.	Lecture

			nce				
		3.	Linkage and crossing over	1.Get concept of linkage, coupling & repulsion. 2. Learn about recombination frequency, linkage maps based on two and three factor crosses. 3. Get knowledge about Crossing over.	1.What is linkage? 2. Define coupling and repulsion. 3. write the significance of crossing over.	S.M.	Lecture
		4.	Mutations and Chromosomal Aberrations	1. Knowing about mutations 2.Learn about Numerical and Structural chromosomal changes.	1. What is mutagen? 2. Deference between Polyploidy and Aneuploidy 3. What is dilation?	S.M.	Lecture
		5.	Plant Breeding	1. Know about Breeding systems. 2. Important achievements and undesirable consequences of plant breeding.	Define plant breeding.	G.M.	Lecture
		6.	Methods of crop improvement	1. Know about Centres of origin and domestication of crop plants. 2. Learn about Selection methods: For self-pollinated, cross pollinated and vegetatively propagated plants. 3. Know about Hybridization	What is Hybridization?	G.M.	Lecture
		7.	Quantitative inheritance	Get Concept ofinheritance, mechanism, examples.	Deference between Monogenic vs polygenic Inheritance.	S.M.	Lecture
		8.	Inbreeding	Know about genetic basis of inbreeding	1.What is Inbreeding	S.M.	Lecture

			depression and heterosis	depression and heterosis; Applications.	depression. 2. Write the application of heterosis		
		9.	Crop improvement and breeding	Knowing about Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement.	Write the role of biotechnology in crop improvement.	G.M.	Lecture
	DSE2P: Genetics and Plant Breeding (Practical)	1.	Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square.	Knowing about Probability and chi-square.	Determine the chi-square test in Mendelian deviation. Data supplied by department.	G.M.	Demonstration
		2.	Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).	Knowing about Incomplete dominance.	Determine Incomplete dominance through seed ratios 13:3.	G.M.	Demonstration
		3.	Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes	Knowing aboutDown's, Klinefelter's and Turner's syndromes for aneuploidy.	Write the cause and symptom ofKlinefelter's syndromes	G.M.	Demonstration

			through photographs.				
		4.	Hybridization techniques.	Learn about hybridization techniques.	Write the process of emasculation.	S.M.	Demonstration
		5.	Induction of polyploidy conditions in plants.			S.M.	Demonstration
	SEC4T: Medicinal Botany	1.	Medicinal Plants	Learn about History, Scope and Importance of Medicinal Plants	1. Name two medicinal plant. 2. Define Ayurveda:	G.M.	Lecture
		2.	Conservation of endangered and endemic medicinal plants.	Knowing about Conservation of endangered and endemic medicinal plants.	1.What is conservation? 2. What is endemic and endanger species? 3. Define In-situ conservation.	S.M.	Lecture
		3.	Ethnobotany and Folk medicines.	Gain knowledge about Ethnobotany and Folk medicines.	1.What is Folk medicine? 2.Write the Applications of Ethnobotany.	G.M.	Lecture

Lesson Plan for (CBCS General) for the Academic Session 2021-2022

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-I							

CC-I	DSC-1AT Biodiversity	1.	a) Viruses.	To know about Structure, Type and Economic importance of Viruses.	1. What is virion? 2. Give example DNA & RNA viruses	G.M.	Lectu re
			b) Bacteria.	To Know About cell structure, Reproduction and economic importance	1.What is plasmid? 2. What is Mesosome? What is Genophore?	S.M.	Lectu re
		2.	Algae	1. General knowledge about algae. 2.Classification of algae 3.Economic importance of algae	1.What is Thallus? 2. Example an algae which is rich in protein. 3. What is the importance of algae in medicine.	G.M.	Lectu re
		3.	Fungi	1.To know about General characteristics of Fungi 2. Knowing reproduction and classification. 3. Knowledge about Nutrition. 4. To know about Symbiotic Associations of Lichens Mycorrhiza.	1. What are true Fungi? 2. Name two edible and poisonous mushroom. 3. What is dolipore septum?	S.M.	Lectu re
		4.	Introductio n to Archegonia te	1.To know about Archegoniate. 2. Knowledge about Alternation of generation.	1. What is Archegoniate ? 2. Define Alternation of generation	S.M.	Lectu re

		5.	Bryophytes	1.Knowing general characteristics, classification of Bryophytes 2. Knowledge about Morphology, anatomy, and Reproduction of Marchantia and Funaria. 3. Know about Ecological importance of bryophytes (Sphagnum)	1. Why Bryophytes are calling amphibian? 2. Write the importance of bryophytes.	S.M.	Lectu re
		6.	Pteridophy tes	1.Knowing about Early land plant 2. Knowing about Morphology, anatomy and Reproduction of selaginella, Equisetum and Pteris. 3. Knowledge about stelar evolution.	1.what is Heterospory ? 2. What is the importance of Selaginella?	G.M.	Lectu re
		7.	Gymnosper m	1. To know General characteristics of gymnosperm. 2. Knowing about morphology, anatomy and reproduction of Cycas and Pinus. 3. Ecological and economical importance.	1.What is Coralloid root? What is the importance of Gymnosperm	G.M.	Lectu re
	DSC-C1P Biodiversity (Microbes, Algae, Fungi and Archegoniate	1.	Models of TMV-viruses	Knowing about Viruses	Draw structures and label its part.	G.M.	Dem onstr ation

	(Practical)						
		2.	Study of vegetative and reproductive structures of algae	Gain knowledge about reproductive structures of Nostoc, Oedogonium, Vaucheria	Write the identifying characters of vaucheria.	G.M.	Demonstration
		3.	Agaricus	Study about Sectioning of gills of Agaricus	Write the identifying characters of Agaricus and draw its fruit body with label.	S.M.	Demonstration
		4.	Selaginella	Know about morphology and strobilus of Selaginella.	Draw and label Strobilus of Selaginella.	S.M.	Demonstration
		5.	Pteris	Knowing about Morphology, rachis and spore of Pteris	Write the characteristics of Pteris.	G.M.	Demonstration

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-II							
CC-II	DSC1B(C2T): Plant Ecology and Taxonomy	1.	Introduction	To know about Ecology.	1.What is ecology? 2. who coined the name ecology	S.M.	Lecture

		2.	Ecological factors	1.Knowing about Soil and its formation. 2. To know about soil profile. 3. Knowledge about States of water in the environment, precipitation types. 4. Knowing Light and temperature 5. Know about Shelford law of tolerance. 6. Know about Adaptation of hydrophytes and xerophytes.	1.What is soil profile? 2.What is capillary water? 3. What is Shelford law? 4. Name two xerophytic plant.	S.M.	Lecture
		3.	Plant communities	1.To know about Ecotone and edge effect 2.Knowledge about Succession, Processes and types.	1. What is ecotone and edge effect? 2. What is the pioneer of xerosere? 3. what is sere?	S.M.	Lecture
		4.	Ecosystem	1. To know about ecosystem, energy flow trophic organization. 2. Knowing Food chains and food webs, Ecological pyramids. 3.To know production and productivity in ecosystem. 4. Knowledge about	1. What is ecosystem? 2. Deference between food chain and food webs. 3. Define Bio-geo-chemical cycle. 4. What is De nitrification.	S.M.	Lecture

				Biogeochemical cycling (carbon, nitrogen and Phosphorous cycle).			
		5.	Phytogeography	1.To know the principle of biogeographical zone. 2. Knowing about Endemism.	Write the definition of Endemism.	S.M.	Lecture
		6.	Introduction to plant Taxonomy	To know about Identification, classification and Nomenclature	1. What is Taxonomy? 2. who coined the name taxonomy	S.M.	Lecture
		7.	Identification	1. Knowledge about Herbarium. 2. Knowing the Functions and Important of herbarium and botanical gardens of the world and India 3. Larne about Documentation Flora, Keys.	1. What is the Measurement of Herbarium shit? 2. Which is the largest Botanical Garden in India and world. 3. What is Flora?	G.M.	Lecture
		8.	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data	To know about Palynology, cytology, phytochemistry and molecular data	1.What is Palynology? 2. What is cytology?	G.M.	Lecture
		9.	Taxonomic hierarchy	1.Knowledge about Ranks, categories and taxonomic groups	1.What is Taxonomic hierarchy? 2. What is Lineal hierarchy? 3. What is Rank?	G.M.	Lecture

		10.	Botanical nomenclature	1. To know about Principles and rules of ICN. 2. Learn about binominal system. 3. Knowing about typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	1.What is binomial nomenclature ? 2. What is author citation and valid publication?	G.M.	Lecture
		11.	Classification	1.Knowing about Types of classification- artificial, natural and phylogenetic. 2. To learn Bentham and Hooker, Engler and Prantl classification	What is classification?	G.M.	Lecture
		12.	Biometrics, numerical taxonomy and cladistics	1. Know about Characters, variations, OTUs, 2. Knowledge about cluster analysis; 3. To learn phenograms, cladograms	1. What is OTUs? 2. Difference between Phenogram and Cladogram.	G.M.	Lecture

	DSC1BP (Plant Ecology and Taxonomy)	1.	Study of morphological adaptations of hydrophytes and xerophytes.	Knowing about morphology of hydrophytes and xerophytes.	Anatomical and Physiological structural diagram of hydrophytes and xerophytes.	G.M.	Demonstration
		2.	Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law	Know about Raunkiaer's frequency distribution law.	Describe minimum size of Quadrate by Raunkiaer's law.	G.M.	Demonstration
		3.	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram, floral formula and systematic position according to Bentham & Hooker's system of classification): Brassicaceae - Brassica, Asteraceae, Vernonia, Tridax; Solanaceae - Solanum nigrum,	To know about floral diagram, floral formula and systematic position.	Description Floral diagram, floral formula.	G.M.	Demonstration

			Liliaceae - Salvia,				
		4.	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	To know prepare Herbarium.	Submitted herbarium copy in the record book.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER-III							
CC3	DSC-1CT Plant Anatomy and Embryology	1.	Meristematic and permanent tissues	1.To knowing about Root and shoot apical meristems. 2. Learn About Simple and complex tissues.	1.Deferencia t between Simple and Complex tissue 2. What is Root apex?	G.M.	Lecture
		2.	Organs	Knowledge about Structure of dicot and monocot root, stem and leaf.		G.M.	Lecture
		3.	Secondary Growth	1. General knowledge about Vascular cambium. 2. Know about Secondary growth in root and stem, Wood.	1.Write the function of vascular cambium. 2. What is Heart wood?	G.M.	Lecture
		4.	Adaptive and protective systems	1.Gain Knowledge about Adaptive and Protective system of plant. 2. Knowing about adaptations in xerophytes and hydrophytes.	1.Write a note about stomata. 2. What is the function of epidermis?	S.M.	Lecture

		5.	Structural organization of flower	1. Know about Structure of anther and pollen. 2. Knowing the types of ovules. 3. Learn about embryo sacs.		S.M.	Lecture
		6.	Pollination and fertilization	1. Knowledge about Pollination and adaptations 2. Brief Knowledge about Double fertilization. 3. Learn about Seed dispersal mechanisms.	1.What is pollination? 2. What is allogamy? 3. Deference between cross & self-pollination.	S.M.	Lecture
		7.	Embryo and endosperm	1. Knowledge about Endosperm 2. Learn about Dicot and monocot embryo.	1.What is embryo? 2. What is the Function of Endosperm?	G.M.	Lecture
		8.	Apomixis and polyembryony	Gain knowledge about Apomixis and polyembryonyan dits practical applications.	1. What is polyembryony. 2. Mention the application of polyembryony	S.M.	Lecture
	DSC1CP: Plant Anatomy and Embryology (Practical)	1.	Study of meristems through permanent slides	Gain knowledge about Meristem.	Write about meristem.	G.M.	Demonstration
		2.	Stem	Learn about monocot stem.	Write characters of monocot stem.	S.M.	Demonstration
		3.	Adaptive anatomy of Xerophyte	Learn about Xerophytic and Hydrophyt	Write the Xerophytic adaptation	G.M.	Demonstration

			and Hydrophyte	Adaptation.	of Hydrilla.		
		4.	Types of ovules:	Know about Ovules of various types.	Describe anatropous and camphylotropous ovules.	G.M.	Demonstration
	SEC-1: Bio-fertilizers	1.	General account about the microbes used as bio fertilizer (Rhizobium)	Learn about Microbes used in bio fertilizer.	1. How isolat Rhizobium? 2. Write uses of Bio fertilizer	G.M.	Lecture
		2.	Azospirillum Azotobacter	1. Know to isolation of Azospirillum. 2. Learn about Azotobactor it's characteristic and crop response.	1. What is crop response of Azotobactor ?	G.M.	Lecture
		3.	Cyanobacteria (blue green algae), Azolla and Anabaena	1. Knowing about Cyanobacteria, Azola and Anabaena 2. Know about Nitrogen fixation by Azolla. 3. Learn about the function of blue green algae & azolla in cultivation of rice.	1. What are Cyanobacteria? 2. How nitrogen fixed by blue green algae? 3. Write the role of azolla in rice cultivation.	S.M.	Lecture
		5.	Mycorrhizal association, VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	1. Learn about Mycoriza,VAM. 2. Knowing VAM to influence on growth and yield of crop plants.	1.What is VAM? 2. Write the function of VAM in crop plant.	S.M.	Lecture

		6.	Organic farming green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.	1. Knowing about organic farming. 2. Learn about organic Fertilizer. 3. Knowing about Recycling of biodegradable wastes. 4. Learn to making of vermicompost and its used.	1.What is organic farming? 2. How recycle biodegradable wastes? 3. Write the application of vermicompost?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-IV							
CC-4	DSC1DT(C4T): Plant Physiology and Metabolism	1.	Plant-water relations	1.Knowing about Importance of water, water potential and its components 2. Get knowledge about Transpiration and its significance. 3. Know about Factors affecting transpiration. 4. Knowledge about Root pressure and guttation.	1. Write importance of water in leaving organs. 2. What is the significance of transpiration in plant? 3. Deference between Transpiration & guttation	G.M.	Lecture
		2.	Mineral nutrition	1. Learn about Essential elements, macro and micronutrients. 2. Knowing Role of	1.Define micro and macro nutrients with example. 2. Describe the	S.M.	Lecture

				essential elements. 3. Get knowledge about Transport of ions across cell membrane 4. Learn about active and passive transport.	role of essential elements in plant. 3. Deference between active and passive transport.		
		3.	Translocation in phloem	1. Knowing about Composition of phloem sap. 2. To know Pressure flow model. 3. Get knowledge about Phloem loading and unloading	1.What is Phloem sap? 2. Define apoplast pathway?	G.M.	Lecture
		4.	Photosynthesis	1. Knowing Photosynthetic Pigments (Chl a, b, xanthophylls, carotene). 2. Get knowledge about Photosystem I and II, reaction center, antenna molecules. 4. Knowing Electron transport and mechanism of ATP synthesis. 4. Knowledge about C3, C4 and CAM pathways of carbon fixation. 5. Learn about Photorespiration.	1. Define Photosynthesis. 2. What are antenna molecules? 3. Describe ATP synthesis. 4. Write about CAM pathway.	G.M.	Lecture
		5.	Respiration	1. Know about Glycolysis, anaerobic respiration, TCA cycle. 2. Knowledge about Oxidative phosphorylation, Glyoxylate. 3. Learn about Oxidative Pentose	1. What is Glycolysis? 2. Write a short note of TCA cycle. 3. What is PPP?	G.M.	Lecture

				Phosphate Pathway.			
		6.	Enzymes	1.Learn about Structure and properties of enzyme. 2. Mechanism of enzyme catalysis and enzyme inhibition.	1.	S.M.	Lecture
		7.	Nitrogen metabolism	Know about Biological nitrogen fixation.	1.What is Nef gen and nod gene? 2. Name two nitrogen fixing bacteria. 3. What is ammonificatio n?	G.M.	Lecture
		8.	Plant growth regulators	Learn about Discovery and physiological roles of auxins, gibberellins, cytokinin, ABA, ethylene.	1.What is PGRs? 2. Write the role of ABA in stress condition in plant. 3. what is triple response	S.M.	Lecture
		9.	Plant response to light and temperature	1.Learn about Photoperiodism. 2.Knoledge about Phytochromeand Vernalization.	1. What is vernalization? 2. Describe phytochrome. 3. What is SDP?	S.M.	Lecture
	DSC-1DP-Plant Physiol ogy and Metab olism (Practi	1.	Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.	Knowledge about Stomatal Index and it's frequency.	Calculate stomatal Index of a mesophyte plant.	G.M.	Demons tration
		2.	Demonstration of Hill reaction	Learn about Hill Reaction.	Demonstratio n of Hill reaction.	P.M.	Demons tration

	cal)	3.	Effect of auxins on rooting.	Know about auxin as PGRs	Demonstratio n of rooting	G.M.	Demons tration
		4.	Determination of osmotic potential of plant cell sap by plasmolytic method.	Knowing about Plasmolytic Methods.	Determination of osmotic potential of plant cell sap by plasmolytic method.	P.M.	Demons tration
		5.	R.Q.	Knowing about R.Q.	Demonstratio n of R.Q.	P.M.	Demons tratio
	SEC2T: Mushr oom Cultur e Techn ology	1.	Introduction	1.To know Nutritional and medicinal value of edible mushrooms. 2. Learn about Poisonous mushrooms. 3. Get knowledge about types of edible mushrooms available in India.	1. How to defer poisonous mushroom from edible one? 2. Describe the nutritional value of mushroom	G.M	Lecture
		2.	Cultivation Technology	1. Learn about Cultivation technology. 2. Learn about Mushroom bed preparation.	Write a note about preparation of mushroom bed.	G.M.	Lecture
		3.	Storage and nutrition	1. Gain knowledge about Short-term storage and long-term Storage. 2. Know about the nutritional value of mushroom.	1.How we store for long time? 2. Write nutritional value of mushroom.	G.M.	Lecture
		4.	Food Preparation	1. Gain knowledge about Types of foods prepared from mushroom. 2. learn Research Centers - National level and regional level. 3. Knowing the Marketing in India and abroad, Export Value.	Which tipes of food prepared from mushroom?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMISTER-V							
	DSE1T: Economic Botany and Biotechnology	1.	Origin of Cultivated Plants	1.Gain Concept of centers of origin. 2. Know their importance with reference to Vavilov's work	Mention the concept of 'Vavilov center of crop origin'	G.M.	Lecture
		2.	Cereals	Know about Wheat & its Origin, morphology,uses.	1. What are cereals? 2. Write the uses of wheat.	G.M	Lecture
		3.	Legumes	Gain knowledge with special reference to Gram and soybean	1. Give note about Gram. 2. Write the scientific name of soybean	G.M.	Lecture
		4.	Spices	Learn about clove and black pepper.	1.Write the scientific name and family of clove. 2. Write the uses of black pepper	G.M.	Lecture
		5.	Beverages	Know about morphology, processing and uses of tea	1.What is Oolong tea? 2. Discuss the processing of tea	G.M.	Lecture
		6.	Oils and Fats	Learn about groundnut	1.Write down the botanical name of groundnut. 2. Discuss uses of groundnut.	G.M.	Lecture
		7.	Fibre Yielding Plants	Gain knowledge about Botanical name, family, part used, morphology and uses of cotton.	Write down the Family of Cotton. 2. Mention the uses of cotton in daily life of human beings.	G.M.	Lecture
		8.	Introduction to biotechnology	Knowing about biotechnology and its significance.	1.What is biotechnology? 2. Write the uses of biotechnology.	S.M.	Lecture
		9.	Plant tissue culture	1. Gain knowledge about Micropropagation.	1.What is micropropagation? 2. Write the	S.M.	Lecture

				2. Knowing about haploid production through androgenesis and gynogenesis 3. Learn to brief account of embryo & endosperm culture with their applications	advantage of micropropagation. 3. What is Totipotency?		
		10.	Recombinant DNA Techniques	1. Knowing about Blotting techniques. 2. Learn about DNA Fingerprinting. 3. Gain knowledge about molecular DNA markers i.e. RAPD, RFLP, SNPs. 4. Learn about PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA. 5. Human gene Therapy.	1.Write down a note of Northern blotting. 2. Describe the significance of DNA Fingerprinting. 3. What is DNA marker? 4. Write the full form of RAPD. 5. What is PCR,write it's use. 6.Briefly describe about Humen genTherapy.	S.M.	Lecture
	DSE1P: Economic Botany and Biotechnology (Practical)	1.	Study of economically important plants	Know about sections and microchemical tests of economically important plant	Section the given specimen and write down its characters	G.M.	Demonstration
		2.	Familiarization with basic equipments in tissue culture	Learn about tissue culture	Describe tissue culture with basic equipment.	G.M.	Demonstration
		3.	Study through photographs	Knowing about Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation	Describe Anther culture with suitable diagram.	S.M.	Demonstration
		4.	Study of molecular techniques	Learn about PCR, Blotting techniques, AGE and PAGE.	Demonstrate blotting techniques.	S.M.	Demonstration

	SEC3T Floriculture	1.	Introduction	Know about gardening, Importance and scope of floriculture	1.What is floriculture? 2. Write down its scope.	G.M	Lecture
		2	Nursery Management and Routine Garden Operations	1.Learn about Sexual and vegetative methods of propagation. 2. knowing Soil sterilization, Seed sowing, Planting and Mulching. 3. Gain knowledge about Role of plant growth regulators.	1. how sterilize soil for nursery? 2. When we mulching a plant? 3. Describe the role of PGRs.	S.M.	Lecture
		3.	Ornamental Plants	1. Learn about ornamental trees, Ornamental bulbous and foliage plants. 2. KnowingCultivation of plants in pots; Indoor gardening; Bonsai.	1. Write two names of succulent plant. 2. What is ornamental tree?	S.M	Lecture
		4.	Principles of Garden Designs	1.Gain knowledge about English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden. 2. Know about Some Famous gardens of India.	1.Describe about Flower beds. 2. Named some famous garden in India.	S.M.	Lecture
		5.	Landscaping Places of Public Importance	Learn about Landscaping highways and educational institutions.	What is landscaping Places?	G.M.	Lecture
		6.	Commercial Floriculture	1. Learn the Factors affecting flower production. 2.Know about Production and packaging of cut flowers; Flower arrangements; Methods to prolong	1 How Gerbera and Aster are cultivated? 2. How factors are affecting on flowering plant?	G.M.	Lecture

				vase life. 3. Get knowledge about Cultivation of Important cut flowers.			
		7.	Diseases and Pests of Ornamental Plants.	Know about ornamental plant Diseases and its pests.	Name some pests of ornamental plant.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER -VI							
	DSE2T: Genetics and Plant Breeding	1.	Heredity	1.Learn brief life history of Mendel and Terminologies 2. Know about Laws of Inheritance, Modified Mendelian Ratios, lethal Genes, Co - dominance, incomplete dominance. 3. Learn about Chi Square, Pedigree Analysis 4. Gain knowledge about Cytoplasmic Inheritance 5.Learn about Multiple allelism, Pleiotropism, Chromosome theory of Inheritance.	1.What is lethal gen? 2. Write down the law of inheritance. 3. Define Co-Dominance and incomplete dominance give example.	G.M.	Lecture
		2.	Sex-determination and Sex-linked Inheritance	Knowing about Sex-determination.	Write a note about sex linked inheritance.	S.M.	Lecture
		3.	Linkage and	1.Get concept of linkage, coupling &	1.What is linkage?	S.M.	Lecture

			crossing over	repulsion. 2. Learn about recombination frequency, linkage maps based on two and three factor crosses. 3. Get knowledge about Crossing over.	2. Define coupling and repulsion. 3. write the significance of crossing over.		
		4.	Mutations and Chromosomal Aberrations	1. Knowing about mutations 2.Learn about Numerical and Structural chromosomal changes.	1. What is mutagen? 2. Deference between Polyploidy and Aneuploidy 3. What is dilation?	S.M.	Lecture
		5.	Plant Breeding	1. Know about Breeding systems. 2. Important achievements and undesirable consequences of plant breeding.	Define plant breeding.	G.M.	Lecture
		6.	Methods of crop improvement	1. Know about Centres of origin and domestication of crop plants. 2. Learn about Selection methods: For self-pollinated, cross pollinated and vegetatively propagated plants. 3. Know about Hybridization	What is Hybridization?	G.M.	Lecture
		7.	Quantitative inheritance	Get Concept ofinheritance, mechanism, examples.	Deference between Monogenic vs polygenic Inheritance.	S.M.	Lecture
		8.	Inbreeding depression and heterosi	Know about genetic basis of inbreeding depression and heterosis; Applications.	1.What is Inbreeding depression. 2. Write the application of	S.M.	Lecture

			s		heterosis		
		9.	Crop improvement and breeding	Knowing about Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement.	Write the role of biotechnology in crop improvement.	G.M.	Lecture
	DSE2P: Genetics and Plant Breeding (Practical)	1.	Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square.	Knowing about Probability and chi-square.	Determine the chi-square test in Mendelian deviation. Data supplied by department.	G.M.	Demonstration
		2.	Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).	Knowing about Incomplete dominance.	Determine Incomplete dominance through seed ratios 13:3.	G.M.	Demonstration
		3.	Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes through photographs.	Knowing aboutDown's, Klinefelter's and Turner's syndromes for aneuploidy.	Write the cause and symptom ofKlinefelter's syndromes	G.M.	Demonstration

		4.	Hybridization techniques.	Learn about hybridization techniques.	Write the process of emasculation.	S.M.	Demonstration
		5.	Induction of polyploidy conditions in plants.	Know about role of polyploidy	Describe how polyploidy use in yield species.	S.M.	Demonstration
	SEC4T: Medicinal Botany	1.	Medicinal Plants	Learn about History, Scope and Importance of Medicinal Plants	1. Name two medicinal plant. 2. Define Ayurveda:	G.M.	Lecture
		2.	Conservation of endangered and endemic medicinal plants.	Knowing about Conservation of endangered and endemic medicinal plants.	1.What is conservation? 2. What is endemic and endanger species? 3. Define In-situ conservation.	S.M.	Lecture
		3.	Ethnobotany and Folk medicines.	Gain knowledge about Ethnobotany and Folk medicines.	1.What is Folk medicine? 2.Write the Applications of Ethnobotany.	G.M.	Lecture

Lesson Plan for (CBCS General) for the Academic Session 2022-2023

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-I							

CC-I	DSC-1AT Biodiversity	1.	a) Viruses.	To know about Structure, Type and Economic importance of Viruses.	1. What is virion? 2. Give example DNA & RNA viruses	G.M.	Lectu re
			b) Bacteria.	To Know About cell structure, Reproduction and economic importance	1.What is plasmid? 2. What is Mesosome? What is Genophore?	S.M.	Lectu re
		2.	Algae	1. General knowledge about algae. 2.Classification of algae 3.Economic importance of algae	1.What is Thallus? 2. Example an algae which is rich in protein. 3. What is the importance of algae in medicine.	G.M.	Lectu re
		3.	Fungi	1.To know about General characteristics of Fungi 2. Knowing reproduction and classification. 3. Knowledge about Nutrition. 4. To know about Symbiotic Associations of Lichens Mycorrhiza.	1. What are true Fungi? 2. Name two edible and poisonous mushroom. 3. What is dolipore septum?	S.M.	Lectu re
		4.	Introductio n to Archegonia te	1.To know about Archegoniate. 2. Knowledge about Alternation of generation.	1. What is Archegoniate ? 2. Define Alternation of generation	S.M.	Lectu re

		5.	Bryophytes	1.Knowing general characteristics, classification of Bryophytes 2. Knowledge about Morphology, anatomy, and Reproduction of Marchantia and Funaria. 3. Know about Ecological importance of bryophytes (Sphagnum)	1. Why Bryophytes are calling amphibian? 2. Write the importance of bryophytes.	S.M.	Lectu re
		6.	Pteridophy tes	1.Knowing about Early land plant 2. Knowing about Morphology, anatomy and Reproduction of selaginella, Equisetum and Pteris. 3. Knowledge about stelar evolution.	1.what is Heterospory ? 2. What is the importance of Selaginella?	G.M.	Lectu re
		7.	Gymnosper m	1. To know General characteristics of gymnosperm. 2. Knowing about morphology, anatomy and reproduction of Cycas and Pinus. 3. Ecological and economical importance.	1.What is Coralloid root? What is the importance of Gymnosperm	G.M.	Lectu re
	DSC-C1P Biodiversity (Microbes, Algae, Fungi	1.	Models of TMV-viruses	Knowing about Viruses	Draw structures and label its part.	G.M.	Dem onstr ation

	and Archegoniate (Practical)	2.	Study of vegetative and reproductive structures of algae	Gain knowledge about reproductive structures of Nostoc, Oedogonium, Vaucheria	Write the identifying characters of vaucheria.	G.M.	Demonstration
		3.	Agaricus	Study about Sectioning of gills of Agaricus	Write the identifying characters of Agaricus and draw its fruit body with label.	S.M.	Demonstration
		4.	Selaginella	Know about morphology and strobilus of Selaginella.	Draw and label Strobilus of Selaginella.	S.M.	Demonstration
		5.	Pteris	Knowing about Morphology, rachis and spore of Pteris	Write the characteristics of Pteris.	G.M.	Demonstration

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-II							
CC-II	DSC1B(C2T): Plant Ecology and Taxonomy	1.	Introduction	To know about Ecology.	1.What is ecology? 2. who coined the name ecology	S.M.	Lecture
		2.	Ecological factors	1.Knowing about Soil and its formation. 2. To know about soil profile. 3. Knowledge	1.What is soil profile? 2.What is capillary water? 3. What is Shelford law? 4. Name two	S.M.	Lecture

				about States of water in the environment, precipitation types. 4. Knowing Light and temperature 5. Know about Shelford law of tolerance. 6. Know about Adaptation of hydrophytes and xerophytes.	xerophytic plant.		
		3.	Plant communities	1.To know about Ecotone and edge effect 2.Knowledge about Succession, Processes and types.	1. What is ecotone and edge effect? 2. What is the pioneer of xerosere? 3. what is sere?	S.M.	Lecture
		4.	Ecosystem	1. To know about ecosystem, energy flow trophic organization. 2. Knowing Food chains and food webs, Ecological pyramids. 3.To know production and productivity in ecosystem. 4. Knowledge about Biogeochemical cycling (carbon, nitrogen and Phosphorous cycle).	1. What is ecosystem? 2. Deference between food chain and food webs. 3. Define Bio-geo-chemical cycle. 4. What is De nitrification.	S.M.	Lecture

		5.	Phytogeography	1.To know the principle of biogeographical zone. 2. Knowing about Endemism.	Write the definition of Endemism.	S.M.	Lecture
		6.	Introduction to plant Taxonomy	To know about Identification, classification and Nomenclature	1. What is Taxonomy? 2. who coined the name taxonomy	S.M.	Lecture
		7.	Identification	1. Knowledge about Herbarium. 2. Knowing the Functions and Important of herbarium and botanical gardens of the world and India 3. Larne about Documentation Flora, Keys.	1. What is the Measurement of Herbarium shit? 2. Which is the largest Botanical Garden in India and world. 3. What is Flora?	G.M.	Lecture
		8.	Taxonomic evidences from palynology, cytology, phytochemistry and molecular data	To know about Palynology, cytology, phytochemistry and molecular data	1.What is Palynology? 2. What is cytology?	G.M.	Lecture
		9.	Taxonomic hierarchy	1.Knowledge about Ranks, categories and taxonomic groups	1.What is Taxonomic hierarchy? 2. What is Lineal hierarchy? 3. What is Rank?	G.M.	Lecture

		10.	Botanical nomenclature	1. To know about Principles and rules of ICN. 2. Learn about binominal system. 3. Knowing about typification, author citation, valid publication, rejection of names, principle of priority and its limitations.	1.What is binomial nomenclature ? 2. What is author citation and valid publication?	G.M.	Lecture
		11.	Classification	1.Knowing about Types of classification- artificial, natural and phylogenetic. 2. To learn Bentham and Hooker, Engler and Prantl classification	What is classification?	G.M.	Lecture
		12.	Biometrics, numerical taxonomy and cladistics	1. Know about Characters, variations, OTUs, 2. Knowledge about cluster analysis; 3. To learn phenograms, cladograms	1. What is OTUs? 2. Difference between Phenogram and Cladogram.	G.M.	Lecture
	DSC1BP (Plant Ecology and Taxonomy)	1.	Study of morphological adaptations of hydrophytes and xerophytes.	Knowing about morphology of hydrophytes and xerophytes.	Anatomical and Physiological structural diagram of hydrophytes and xerophytes.	G.M.	Demonstration

		2.	Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law	Know about Raunkiaer's frequency distribution law.	Describe minimum size of Quadrate by Raunkiaer's law.	G.M.	Demonstration
		3.	Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram, floral formula and systematic position according to Bentham & Hooker's system of classification): Brassicaceae - Brassica, Asteraceae, Vernonia, Tridax; Solanaceae - Solanum nigrum, Liliaceae - Salvia,	To know about floral diagram, floral formula and systematic position.	Description Floral diagram, floral formula.	G.M.	Demonstration

		4.	Mounting of a properly dried and pressed specimen of any wild plant with herbarium label	To know prepare Herbarium.	Submitted herbarium copy in the record book.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER-III							
CC3	DSC-1CT Plant Anatomy and Embryology	1.	Meristematic and permanent tissues	1.To knowing about Root and shoot apical meristems. 2. Learn About Simple and complex tissues.	1.Deferencia t between Simple and Complex tissue 2. What is Root apex?	G.M.	Lecture
		2.	Organs	Knowledge about Structure of dicot and monocot root, stem and leaf.		G.M.	Lecture
		3.	Secondary Growth	1. General knowledge about Vascular cambium. 2. Know about Secondary growth in root and stem, Wood.	1.Write the function of vascular cambium. 2. What is Heart wood?	G.M.	Lecture
		4.	Adaptive and protective systems	1.Gain Knowledge about Adaptive and Protective system of plant. 2. Knowing about adaptations in xerophytes and hydrophytes.	1.Write a note about stomata. 2. What is the function of epidermis?	S.M.	Lecture
		5.	Structural organization	1. Know about Structure of		S.M.	Lecture

			of flower	anther and pollen. 2. Knowing the types of ovules. 3. Learn about embryo sacs.			
		6.	Pollination and fertilization	1. Knowledge about Pollination and adaptations 2. Brief Knowledge about Double fertilization. 3. Learn about Seed dispersal mechanisms.	1.What is pollination? 2. What is allogamy? 3. Deference between cross & self-pollination.	S.M.	Lecture
		7.	Embryo and endosperm	1. Knowledge about Endosperm 2. Learn about Dicot and monocot embryo.	1.What is embryo? 2. What is the Function of Endosperm?	G.M.	Lecture
		8.	Apomixis and polyembryony	Gain knowledge about Apomixis and polyembryonyan dits practical applications.	1. What is polyembryony. 2. Mention the application of polyembryony	S.M.	Lecture
	DSC1CP: Plant Anatomy and Embryology (Practical)	1.	Study of meristems through permanent slides	Gain knowledge about Meristem.	Write about meristem.	G.M.	Demonstration
		2.	Stem	Learn about monocot stem.	Write characters of monocot stem.	S.M.	Demonstration
		3.	Adaptive anatomy of Xerophyte and Hydrophyte	Learn about Xerophytic and Hydrophyt Adaptation.	Write the Xerophytic adaptation of Hydrilla.	G.M.	Demonstration

		4.	Types of ovules:	Know about Ovules of various types.	Describe anatropous and camphylotropous ovules.	G.M.	Demonstration
	SEC-1: Bio-fertilizers	1.	General account about the microbes used as bio fertilizer (Rhizobium)	Learn about Microbes used in bio fertilizer.	1. How isolat Rhizobium? 2. Write uses of Bio fertilizer	G.M.	Lecture
		2.	Azospirillum Azotobacter	1. Know to isolation of Azospirillum. 2. Learn about Azotobactor it's characteristic and crop response.	1. What is crop response of Azotobactor ?	G.M.	Lecture
		3.	Cyanobacteria (blue green algae), Azolla and Anabaena	1. Knowing about Cyanobacteria, Azola and Anabaena 2. Know about Nitrogen fixation by Azolla. 3. Learn about the function of blue green algae & azolla in cultivation of rice.	1. What are Cyanobacteria? 2. How nitrogen fixed by blue green algae? 3. Write the role of azolla in rice cultivation.	S.M.	Lecture
		5.	Mycorrhizal association, VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	1. Learn about Mycoriza,VAM. 2. Knowing VAM to influence on growth and yield of crop plants.	1.What is VAM? 2. Write the function of VAM in crop plant.	S.M.	Lecture
		6.	Organic farming	1. Knowing about organic	1.What is organic	G.M.	Lecture

			green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.	farming. 2. Learn about organic Fertilizer. 3. Knowing about Recycling of biodegradable wastes. 4. Learn to making of vermicompost and its used.	farming? 2. How recycle biodegradable wastes? 3. Write the application of vermicompost?		

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMESTER-IV							
CC-4	DSC1DT(C4T): Plant Physiology and Metabolism	1.	Plant-water relations	1.Knowing about Importance of water, water potential and its components 2. Get knowledge about Transpiration and its significance. 3. Know about Factors affecting transpiration. 4. Knowledge about Root pressure and guttation.	1. Write importance of water in leaving organs. 2. What is the significance of transpiration in plant? 3. Deference between Transpiration & guttation	G.M.	Lecture
		2.	Mineral nutrition	1. Learn about Essential elements, macro and micronutrients. 2. Knowing Role of essential elements. 3. Get knowledge	1.Define micro and macro nutrients with example. 2. Describe the role of essential	S.M.	Lecture

				about Transport of ions across cell membrane 4. Learn about active and passive transport.	elements in plant. 3. Deference between active and passive transport.		
		3.	Translocation in phloem	1. Knowing about Composition of phloem sap. 2. To know Pressure flow model. 3. Get knowledge about Phloem loading and unloading	1.What is Phloem sap? 2. Define apoplast pathway?	G.M.	Lecture
		4.	Photosynthesis	1. Knowing Photosynthetic Pigments (Chl a, b, xanthophylls, carotene). 2. Get knowledge about Photosystem I and II, reaction center, antenna molecules. 4. Knowing Electron transport and mechanism of ATP synthesis. 4. Knowledge about C3, C4 and CAM pathways of carbon fixation. 5. Learn about Photorespiration.	1. Define Photosynthesis. 2. What are antenna molecules? 3. Describe ATP synthesis. 4. Write about CAM pathway.	G.M.	Lecture
		5.	Respiration	1. Know about Glycolysis, anaerobic respiration, TCA cycle. 2. Knowledge about Oxidative phosphorylation, Glyoxylate. 3. Learn about Oxidative Pentose Phosphate Pathway.	1. What is Glycolysis? 2. Write a short note of TCA cycle. 3. What is PPP?	G.M.	Lecture

		6.	Enzymes	1.Learn about Structure and properties of enzyme. 2. Mechanism of enzyme catalysis and enzyme inhibition.	1.	S.M.	Lecture
		7.	Nitrogen metabolism	Know about Biological nitrogen fixation.	1.What is Nef gen and nod gene? 2. Name two nitrogen fixing bacteria. 3. What is ammonificatio n?	G.M.	Lecture
		8.	Plant growth regulators	Learn about Discovery and physiological roles of auxins, gibberellins, cytokinin, ABA, ethylene.	1.What is PGRs? 2. Write the role of ABA in stress condition in plant. 3. what is triple response	S.M.	Lecture
		9.	Plant response to light and temperature	1.Learn about Photoperiodism. 2.Knoledge about Phytochromeand Vernalization.	1. What is vernalization? 2. Describe phytochrome. 3. What is SDP?	S.M.	Lecture
	DSC-1DP-Plant Physiol ogy and Metab olism (Practi cal)	1.	Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.	Knowledge about Stomatal Index and it's frequency.	Calculate stomatal Index of a mesophyte plant.	G.M.	Demons tration
		2.	Demonstration of Hill reaction	Learn about Hill Reaction.	Demonstratio n of Hill reaction.	P.M.	Demons tration
		3.	Effect of auxins on rooting.	Know about auxin as PGRs	Demonstratio n of rooting	G.M.	Demons tration
		4.	Determination of osmotic potential of plant cell sap by	Knowing about Plasmolytic Methods.	Determination of osmotic potential of plant cell sap	P.M.	Demons tration

			plasmolytic method.		by plasmolytic method.		
		5.	R.Q.	Knowing about R.Q.	Demonstration of R.Q.	P.M.	Demonstratio
	SEC2T: Mushroom Culture Technology	1.	Introduction	1.To know Nutritional and medicinal value of edible mushrooms. 2. Learn about Poisonous mushrooms. 3. Get knowledge about types of edible mushrooms available in India.	1. How to defer poisonous mushroom from edible one? 2. Describe the nutritional value of mushroom	G.M	Lecture
		2.	Cultivation Technology	1. Learn about Cultivation technology. 2. Learn about Mushroom bed preparation.	Write a note about preparation of mushroom bed.	G.M.	Lecture
		3.	Storage and nutrition	1. Gain knowledge about Short-term storage and long-term Storage. 2. Know about the nutritional value of mushroom.	1.How we store for long time? 2. Write nutritional value of mushroom.	G.M.	Lecture
		4.	Food Preparation	1. Gain knowledge about Types of foods prepared from mushroom. 2. learn Research Centers - National level and regional level. 3. Knowing the Marketing in India and abroad, Export Value.	Which tipes of food prepared from mushroom?	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Questions	Teacher	Teaching Methods
SEMISTER-V							
	DSE1T: Economic Botany and Biotechnology	1.	Origin of Cultivated Plants	1.Gain Concept of centers of origin. 2. Know their importance with reference to Vavilov's work	Mention the concept of 'Vavilov center of crop origin'	G.M.	Lecture
		2.	Cereals	Know about Wheat & its Origin, morphology,uses.	1. What are cereals? 2. Write the uses of wheat.	G.M	Lecture
		3.	Legumes	Gain knowledge with special reference to Gram and soybean	1. Give note about Gram. 2. Write the scientific name of soybean	G.M.	Lecture
		4.	Spices	Learn about clove and black pepper.	1.Write the scientific name and family of clove. 2. Write the uses of black pepper	G.M.	Lecture
		5.	Beverages	Know about morphology, processing and uses of tea	1.What is Oolong tea? 2. Discuss the processing of tea	G.M.	Lecture
		6.	Oils and Fats	Learn about groundnut	1.Write down the botanical name of groundnut. 2. Discuss uses of groundnut.	G.M.	Lecture
		7.	Fibre Yielding Plants	Gain knowledge about Botanical name, family, part used, morphology and uses of cotton.	Write down the Family of Cotton. 2. Mention the uses of cotton in daily life of human beings.	G.M.	Lecture
		8.	Introduction to biotechnology	Knowing about biotechnology and its significance.	1.What is biotechnology? 2. Write the uses of biotechnology.	S.M.	Lecture
		9.	Plant tissue culture	1. Gain knowledge about Micropropagation. 2. Knowing about haploid production	1.What is micropropagation? 2. Write the advantage of micropropagation.	S.M.	Lecture

				through androgenesis and gynogenesis 3. Learn to brief account of embryo & endosperm culture with their applications	3. What is Totipotency?		
		10.	Recombinant DNA Techniques	1. Knowing about Blotting techniques. 2. Learn about DNA Fingerprinting. 3. Gain knowledge about molecular DNA markers i.e. RAPD, RFLP, SNPs. 4. Learn about PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA. 5. Human gene Therapy.	1.Write down a note of Northern blotting. 2. Describe the significance of DNA Fingerprinting. 3. What is DNA marker? 4. Write the full form of RAPD. 5. What is PCR, write it's use. 6.Briefly describe about Humen gene Therapy.	S.M.	Lecture
	DSE1P: Economic Botany and Biotechnology (Practical)	1.	Study of economically important plants	Know about sections and microchemical tests of economically important plant	Section the given specimen and write down its characters	G.M.	Demonstration
		2.	Familiarization with basic equipments in tissue culture	Learn about tissue culture	Describe tissue culture with basic equipment.	G.M.	Demonstration
		3.	Study through photographs	Knowing about Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation	Describe Anther culture with suitable diagram.	S.M.	Demonstration
		4.	Study of molecular techniques	Learn about PCR, Blotting techniques, AGE and PAGE.	Demonstrate blotting techniques.	S.M.	Demonstration
	SEC3T Floricul	1.	Introduction	Know about gardening,	1. What is floriculture?	G.M	Lecture

	ture			Importance and scope of floriculture	2. Write down its scope.		
		2	Nursery Management and Routine Garden Operations	1.Learn about Sexual and vegetative methods of propagation. 2. knowing Soil sterilization, Seed sowing, Planting and Mulching. 3. Gain knowledge about Role of plant growth regulators.	1. How sterilize soil for nursery? 2. When we mulching a plant? 3. Describe the role of PGRs.	S.M.	Lecture
		3.	Ornamental Plants	1. Learn about ornamental trees, Ornamental bulbous and foliage plants. 2. KnowingCultivation of plants in pots; Indoor gardening; Bonsai.	1. Write two names of succulent plant. 2. What is ornamental tree?	S.M	Lecture
		4.	Principles of Garden Designs	1.Gain knowledge about English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden. 2. Know about Some Famous gardens of India.	1.Describe about Flower beds. 2. Named some famous garden in India.	S.M.	Lecture
		5.	Landscaping Places of Public Importance	Learn about Landscaping highways and educational institutions.	What is landscaping Places?	G.M.	Lecture
		6.	Commercial Floriculture	1. Learn the Factors affecting flower production. 2.Know about Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life. 3. Get knowledge	1 How Gerbera and Aster are cultivated? 2. How factors are affecting on flowering plant?	G.M.	Lecture

				about Cultivation of Important cut flowers.			
		7.	Diseases and Pests of Ornamental Plants.	Know about ornamental plant Diseases and its pests.	Name some pests of ornamental plant.	G.M.	Lecture

Type	Paper	Unit	Topic	Learning Objectives	Related Question	Teacher	Teaching Methods
SEMESTER -VI							
	DSE2T: Genetics and Plant Breeding	1.	Heredity	1.Learn brief life history of Mendel and Terminologies 2. Know about Laws of Inheritance, Modified Mendelian Ratios, lethal Genes, Co - dominance, incomplete dominance. 3. Learn about Chi Square, Pedigree Analysis 4. Gain knowledge about Cytoplasmic Inheritance 5.Learn about Multiple allelism, Pleiotropism, Chromosome theory of Inheritance.	1.What is lethal gen? 2. Write down the law of inheritance. 3. Define Co-Dominance and incomplete dominance give example.	G.M.	Lecture
		2.	Sex-determination and Sex-linked Inheritance	Knowing about Sex-determination.	Write a note about sex linked inheritance.	S.M.	Lecture
		3.	Linkage and crossing over	1.Get concept of linkage, coupling & repulsion. 2. Learn about	1.What is linkage? 2. Define coupling and	S.M.	Lecture

				recombination frequency, linkage maps based on two and three factor crosses. 3. Get knowledge about Crossing over.	repulsion. 3. write the significance of crossing over.		
		4.	Mutations and Chromosomal Aberrations	1. Knowing about mutations 2.Learn about Numerical and Structural chromosomal changes.	1. What is mutagen? 2. Deference between Polyploidy and Aneuploidy 3. What is dilation?	S.M.	Lecture
		5.	Plant Breeding	1. Know about Breeding systems. 2. Important achievements and undesirable consequences of plant breeding.	Define plant breeding.	G.M.	Lecture
		6.	Methods of crop improvement	1. Know about Centres of origin and domestication of crop plants. 2. Learn about Selection methods: For self-pollinated, cross pollinated and vegetatively propagated plants. 3. Know about Hybridization	What is Hybridization?	G.M.	Lecture
		7.	Quantitative inheritance	Get Concept ofinheritance, mechanism, examples.	Deference between Monogenic vs polygenic Inheritance.	S.M.	Lecture
		8.	Inbreeding depression and heterosis	Know about genetic basis of inbreeding depression and heterosis; Applications.	1.What is Inbreeding depression. 2. Write the application of heterosis	S.M.	Lecture
		9.	Crop	Knowing about Role	Write the role	G.M.	Lecture

			improvement and breeding	of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement.	of biotechnology in crop improvement.		
	DSE2P: Genetics and Plant Breeding (Practical)	1.	Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square.	Knowing about Probability and chi-square.	Determine the chi-square test in Mendelian deviation. Data supplied by department.	G.M.	Demonstration
		2.	Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).	Knowing about Incomplete dominance.	Determine Incomplete dominance through seed ratios 13:3.	G.M.	Demonstration
		3.	Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes through photographs.	Knowing aboutDown's, Klinefelter's and Turner's syndromes for aneuploidy.	Write the cause and symptom ofKlinefelter's syndromes	G.M.	Demonstration
		4.	Hybridization	Learn about hybridization	Write the process of	S.M.	Demonstration

			techniques.	techniques.	emasculation.		
		5.	Induction of polyploidy conditions in plants.	Know about role of polyploidy	Describe how polyploidy use in yield species.	S.M.	Demonstration
	SEC4T: Medicinal Botany	1.	Medicinal Plants	Learn about History, Scope and Importance of Medicinal Plants	1. Name two medicinal plant. 2. Define Ayurveda:	G.M.	Lecture
		2.	Conservation of endangered and endemic medicinal plants.	Knowing about Conservation of endangered and endemic medicinal plants.	1.What is conservation? 2. What is endemic and endanger species? 3. Define In-situ conservation.	S.M.	Lecture
		3.	Ethnobotany and Folk medicines.	Gain knowledge about Ethnobotany and Folk medicines.	1.What is Folk medicine? 2.Write the Applications of Ethnobotany.	G.M.	Lecture